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DIAMOND DRILLING OF THE BIG INDIAN LAKE POLYPHASE INTRUSIVE SUITE (N.T.S. MAP 11D/13)

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DIAMOND DRILLING OF THE BIG INDIAN LAKE POLYPHASE INTRUSIVE SUITE; HALIFAX CO., NOVA SCOTIA. (N.T.S. MAP 11D/13)

INTRODUCTION

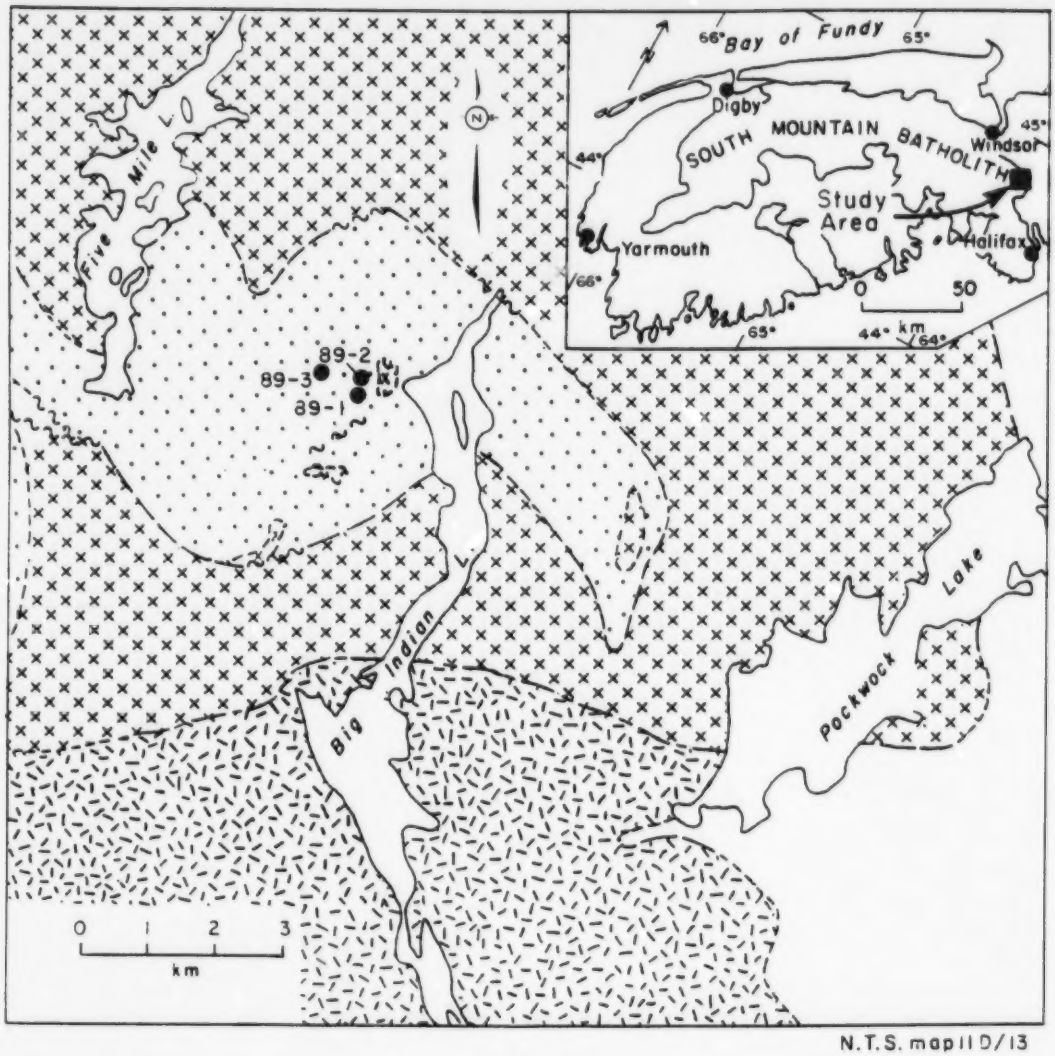
This report presents descriptive and graphical logs for three diamond drill holes located approximately 40km northwest of Halifax, near the eastern margin of the South Mountain Batholith (SMB; Fig.1). The holes are situated in an area of the SMB occupied by a polyphase suite of monzogranite named the Big Indian Polyphase Intrusive Suite (BIPIS). A geological overview follows below. The holes, which were drilled by the Department of Mines and Energy, commenced in September 1989 and were completed in January 1990. The core is stored at the core library facilities in Stellarton, N.S. The graphical logs were produced using the Logger program developed by Rockware Inc., Colorado.

DDH #	AZIMUTH (from true N)	DIP	DEPTH (feet)	NORTHING (UTM-grid)	EASTING
BIPI-89-1	90°	60°	504	4963640	425524
BIPI-89-2	110°	60°	498	4963960	425710
BIPI-89-3		90°	1544	4964375	425510

GEOLOGY OF THE STUDY AREA

The BIPIS is comprised of two 18-20 km^2 bodies which intrude biotite granodiorite of the SMB (Corey, 1986; Ham & Horne, 1986). The BIPIS consists of four, mineralogically similar but texturally variable granitic facies (Fig.2; Plates 1-6). In order of decreasing abundance these are: 1) megacrystic (K-feldspar) muscovite + biotite monzogranite - leucomonzogranite (< 6% biotite); 2) porphyritic biotite monzogranite; 3) equigranular muscovite + biotite leucomonzogranite and 4) fine grained leucogranite (<2% biotite), herein referred to as microgranite. Field observations suggest that the different facies have intrusive relationships, and that the microgranite was the last to intrude. Petrological studies (Kontak & Corey, 1988; Corey, 1988) indicate that the facies of the BIPIS have undergone considerable late-to post-magmatic mineralogical and textural modification in response to metasomatism.

In addition to the above facies, several small pods ($\leq$5 m^2) of a plagioclase-rich rock occur within the megacrystic facies and are thought to represent cumulate material.



N.T.S. map 11 D/13

LEGEND

- undivided metasediments of the Meguma Group
- biotite granodiorite
- biotite ± muscovite ± cordierite monzogranite
- BIPIS-suite

Shear zone ..... ~~~

Diamond drill hole location and number..... ●89-2

The BIPIS also contains abundant biotite granodiorite xenoliths (roof pendants?) which in turn possess numerous metasedimentary xenoliths of variable size ($\leq 10m^2$) and shape. No metasedimentary xenoliths have been observed within rocks of the BIPIS.

Alteration:

Field and drill core observations suggests that alteration and mineralization were polyphase and were an integral part of the geological evolution of the BIPIS. An example of this is the common occurrence of spessartine-rich garnet (15-27 mole% Spess.). In samples taken from surface exposures the garnet displays an antipathetic relationship with biotite characterized by a biotite-free halo. Kontak & Corey (1988) concluded that they are of metasomatic origin. In contrast, many garnets observed in BIPI-89-3 drill core occur with biotite. Other alteration effects in decreasing magnitude include; K-feldspathization (manifested by K-feldspar-rich dykes and biotization), albitization, sericitization, silicification, hematization, chloritization and high alumina which is characterized by abundant andalusite (Corey, 1988).

Although the metasomatic effects are present in all units (high alumina excepted), field observations indicate that they are most intense within and proximal to the microgranite facies.

Mineralization:

Several types of mineralization have occurred within the BIPIS. These include: 1) north-south trending, en-echelon quartz veins which contain disseminations of coarse grained wolframite with minor chalcopyrite and scheelite. The veins range from 1 - 10 cm wide and are restricted to the microgranite unit. 2) north-south trending, chlorite-tourmaline-bearing greisen veins and small (≤ 10 cm^2), pyrite + chalcopyrite-bearing, quartz-muscovite greisen pods also confined to the microgranite. 3) Disseminated uranium-phosphate (torbernite $\pm$ autunite) minerals also occur in association with intense hematization within a northeast-trending shear zone.

Although fluorite is rare within the BIPIS, tourmaline occurs as disseminations within greisens and as massive hydrothermal replacement pods (≤ 20 cm^2) within a kaolinized shear zone.

Field observations indicate that early pervasive styles of alteration (e.g. K-feldspathization) and mineralization (e.g. sulphide-bearing greisen pods) are overprinted by later fracture-controlled high alumina alteration and wolframite-bearing quartz veins.

DRILLING OBJECTIVES:

BIPI-89-1: Situated within microgranite, the purpose of this hole was to investigate the nature of this unit at depth, noting any textural and mineralogical variations. The nature of the contact with other BIPIS facies was also of interest. This hole was drilled in the area of wolframite-bearing quartz veins.

BIPI-89-2: This hole was spotted to intersect a north-east-trending shear zone. The shear zone is well exposed in a gravel pit and appears to have been a conduit for successive and superimposed hydrothermal alteration. Of particular interest was a lense of high alumina alteration which is unique to the SMB. Also focused along the shear zone is disseminated uranium-phosphate mineralization. The purpose was to investigate the nature and extent of the alteration zone at depth.

BIPI-89-3: This hole was spotted on a cumulate outcrop in an area where all of the BIPIS-facies are exposed. The purpose of this the deepest hole was to investigate the contact relationships of the various facies and to document any mineralogical and textural variations in the facies with depth.

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PLATE CAPTIONS

A) Photo from BIPI-89-3 showing sharp contact between the megacrystic and microgranite facies (right). The arrow points to one of the many small garnet crystals which occur throughout the microgranite. Note that the area of garnet metasomatism also has a finer-grained texture.

B) Specimen of equigranular-textured facies.

C) Specimen of porphyry textured facies. The arrows point to garnets. This sample contains more garnets than is usual for this facies.

D) Photo shows typical cumulate rock characterized by abundant euhedral laths of oscillatory-zoned plagioclase feldspar. The groundmass is commonly comprised of quartz, biotite and chlorite.

E) Specimen of chlorite-rich, sulphide-bearing greisen pod (dark section).

F) Photo shows some of the intense deformation seen throughout BIPI-89-2. This particular sample of granodiorite also reflects the effects of intense chloritization.

DESCRIPTIVE

LOGS

BIPI-89-1 DESCRIPTIVE LOG

0.0 to 4.0: OVERBURDEN:

4.0 to 22.0: LEUCOMONZOGRANITE: light pinkish grey, medium to coarse grained, moderately equigranular, to slightly porphyritic, moderate chloritization, intensely-fractured, rare garnet aggregates.

22.0 to 30.2: LEUCOMONZOGRANITE: medium pink, fine to medium grained, moderately equigranular, rare garnet; moderate to intense fracture-controlled kaolinization, biotite displays intense chloritization and hematization, pegmatite pods from 25-27'

30.2 to 44.5: MUSCOVITE-BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular to slightly megacrystic (<5%), moderate hematization, 1-2mm wide shear zones (35-36.5') associated with intense fracture-controlled chloritization and kaolinization.

44.5 to 73.3: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), contact with above marked by 1cm. biotite rich band, moderate saussuritization and blue-quartz alteration (60'), intense fracture-controlled kaolinization.

73.3 to 82.0: LEUCOMONZOGRANITE: medium orange-pink, medium grained, equigranular to porphyritic, (contains 5-9% biot.) intense fracture-controlled hematization, (75-78'); plagioclase phenocrysts display intense kaolinization; minor garnet; numerous pink, K-feldspathized fractures.

82.0 to 86.0: LEUCOMONZOGRANITE: pink, fine-to medium-grained, moderately equigranular, vuggy; diffuse contact with above, section may be alteration zone; intensely-fractured at approximately 30°/CA - 83-83.3; approximately 5% disseminated chalcopyrite and pyrite within a greisen pod.

86.0 to 91.0: LEUCOMONZOGRANITE: medium grained, moderately equigranular, to porphyritic, common garnet aggregates, at 90.5-91'

91.0 to 92.5: MICROGRANITE: pink, abundant garnet aggregates, most contain biotite inclusions; approximately 10cm on either side of dyke displays an increase in modal garnet; up-hole contact with leucomonzogranite marked by pegmatite whereas contact with below appears to be gradational.

92.5 to 93.5: LEUCOMONZOGRANITE: pink, vuggy, intensely-fractured.

94.5 to 95.5: **MUSCOVITE-BIOTITE MONZOGRANITE:** medium to coarse grained, porphyritic, contact with above diffuse, may be metasomatic boundary rather than lithologic.

95.5 to 99.0: **LEUCOMONZOGRANITE:** varies to leucogranite; pink, vuggy, moderately equigranular; intensely sheared with abundant slickensides.

99.0 to 119.0: **LEUCOMONZOGRANITE:** medium to coarse grained, moderately equigranular to slightly porphyritic, vuggy, intensely-fractured with abundant slickensides. Biotite varies from <2-8%, common garnet aggregates;
- 103.8; greisen vein (5cm) with fine-to coarse disseminations
of chalcopyrite and pyrite.

119.0 to 139.0: **LEUCOMONZOGRANITE:** light pinkish grey, medium to coarse grained, moderately equigranular to slightly megacrystic (<5%), intensely-fractured, with moderate-intense fracture-controlled K-feldspathization and moderate saussuritization. Cordierite and garnet common throughout section. -123', 128', 130'; Quartz veins (2-4 cm. wide) with minor chalcopyrite at 45°/CA.

133.0 to 133.7: **MICROGRANITE:** light orange and contains abundant garnet aggregates; contacts marked by pegmatite.

39.0 to 143.5: **LEUCOMONZOGRANITE:** pink, fine to medium grained, moderately equigranular; 5cm wide quartz vein at 143'.

143.5 to 173.0: **LEUCOMONZOGRANITE:** medium to coarse grained, moderately equigranular to slightly megacrystic (<5%): moderate to intense pervasive silicification and K-feldspathization; common cordierite and rare garnet except for coarse aggregates within and adjacent to alteration zones (149-150.5'; 160';167.7-170.5') associated with silicification. Section is moderately to intensely-fractured (mylonite band at 172') and followed by 15cm of abundant disseminated Cu mineralization (malachite, diginite, chrysocolla).

173.0 to 183.0: **LEUCOMONZOGRANITE:** light orange-pink, medium to coarse grained, moderately equigranular to slightly porphyritic, moderately to intensely-fractured; mylonite bands at 177.5'. Rare garnet.

183.0 to 224.5: **GRANODIORITE:** medium to coarse grained, moderately equigranular, slightly megacrystic (<5%), blue-quartz and biotite-rich (12-18%). Plagioclase displays moderate saussuritization. Section from 194-200' is intensely-fractured. In sharp contact with leucomonzogranite.

224.5 to 233.0: **LEUCOMONZOGRANITE:** buff orange, medium to coarse grained, moderately equigranular, no garnet. Section contains several thin calcite-bearing fractures.

233.0 to 238.5: **GRANODIORITE:** medium to coarse grained, moderately equigranular displays moderate saussuritization and contains blue-quartz.

238.5 to 284.0: **LEUCOMONZOGRANITE:** light grey, pinkish grey, fine to medium grained, moderately equigranular, to slightly porphyritic; intensely-fractured; in sharp contact with granodiorite, garnet absent. Pegmatite pod (5cm) at 269' contains fine disseminated chalcopyrite within biotite clots.

- 269.5-271.5': granodiorite xenolith, intensely- fractured, and deformed, minor calcite veining.
- 271.5'- 3cm wide qtz-sericite band with chalcopyrite and chalcocite at contact with granodiorite.
- 274.5-277.5': granodiorite xenolith, downhole contact is offset approximately 3 cm.

284.0 to 368.0: **GRANODIORITE:** medium-to coarse-grained, slightly megacrystic (<5%), blue-quartz, intensely sheared (commonly 0-30°/CA) with common slickensides, and calcite; intense-pervasive chloritization/saussuritization.

- 285-289'- zone of intense shearing, numerous thin mylonite bands
- 295.5'- 25 cm wide zone of intense shearing/ deformation
- 300-304'- leucomonzogranite dyke; intensely fractured; several granodiorite xenoliths surrounded by rim of graphic granite/myrmekite
- 312-318'- intensely sheared with thin mylonite bands, most show offset along fractures; intense-pervasive chloritization and saussuritization
- 328.5'- several 1cm. wide mylonite bands; very intense chloritization.
- 340-344.5'- intensely sheared with mylonite bands
- 354-357'- very intense shearing, 10cm wide crush breccia (354.5') with calcite cement

368.0 to 375.0: **LEUCOMONZOGRANITE:** light buff-orange, fine-to medium-grained moderately equigranular; intensely sheared.

375.0 to 422.0: **BIOTITE MONZOGRANITE:** medium to coarse grained, moderately equigranular, intensely-fractured:
-381.5-383'- granodiorite xenolith with aplite/pegmatite rim contact with granodiorite (below) marked by 10cm wide band of >25% biotite

422.0 to 437.0: **GRANODIORITE:** medium to coarse grained, slightly megacrystic (<5%), moderate saussuritization, chloritization and blue-quartz alteration. At 434'; microgranite dyke in shear contact with granodiorite.

437.0 to 440.0: **MICROGRANITE:** medium pink, uphole contact with granodiorite marked by pegmatite; downhole contact with granodiorite is sheared.

440.0 to 444.0: **SHEAR ZONE:** brittle/ductile shear characterized by pervasive chloritization.

444.0 to 469.0: **LEUCOMONZOGRANITE:** fine to medium grained, medium to coarse grained, moderately equigranular to slightly porphyritic; section contains numerous calcite-filled fractures.

469.0 to 504.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%); 492-504' displays intense fracture-controlled and pervasive alteration.

-504.0: END OF HOLE

BIPI-89-2 DESCRIPTIVE LOG

0.0 to 4.0: OVERBURDEN:

4.0 to 37.5: BIOTITE MONZOGRANITE: medium grained, moderately equigranular, moderate to intense pervasive and fracture-controlled chloritization of biotite and kaolinization of plagioclase feldspar, moderate hematization.
- 10-25'- intense hematization
- 20-24'- hematite breccia, core extremely friable, possible fluid breccia

37.5 to 45.5: MICROGRANITE: dyke, in sharp contact with above, contains many small 1-2mm pale-pink to deep red-orange garnets, also several small pegmatite pods at 38'.

45.5 to 108.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular;
-45.5-64'- mild chloritization, hematization.
-47'- 10 cm. microgranite dyke with abundant small garnets
-71'- 10 cm of intensely fractured/sheared core
-77.8'-intense pervasive hematization

96.0 to 108.0: CALCITE BRECCIA: characterized by intense pervasive hematization, chloritization and kaolinization.

108.0 to 149.0: MICROGRANITE: fine grained,equigranular, light orange-pink, minor garnet; numerous brittle/ductile shears at 45°/CA.
-139-143'-zone of high alumina alteration associated with intense hematization and chloritization, minor disseminated pyrite, core is extremely friable
-144-149'-intense brittle deformation, numerous open vugs and cavities associated with fractures, also zone of intense desilicification and K-feldspathization.

149.0 to 167.5: LEUCOMONZOGRANITE: medium grained moderately equigranular, intensely sheared; both brittle and ductile deformation, minor displacement along shear planes; section contains intense pervasive hematization and several sheared, angular biotite monzogranite xenoliths.

167.5 to 168.0: SHEAR ZONE:

168.0 to 200.0: BIOTITE MONZOGRANITE: medium -to coarse- grained, moderately equigranular; sheared with intense pervasive chloritization and hematization, open vugs common;
-180-182'- intensely-sheared with dilated tension-gashes

200.0 to 208.0: **LEUCOGRANITE:** medium orange-red, fine-to medium- grained, moderately equigranular, sheared, tension gashes common.

208.0 to 280.0: **BIOTITE MONZOGRANITE:** medium -to coarse- grained, moderately equigranular, sheared with tension gashes, moderate to intense pervasive chloritization, hematization and kaolinization; contact with above marked by 15 cm wide biotite -rich shear zone, minor calcite veins.

280.0 to 307.0: **GRANODIORITE:** medium -to coarse- grained, moderately equigranular, intense pervasive chloritization, hematization and kaolinization; core is broken and extremely friable, common calcite veins.

307.0 to 327.0: **GRANODIORITE:** medium -to coarse- grained, moderately equigranular, mild to moderate fracture-controlled saussuritization, chloritization and hematization; common calcite veins.
-318.0 to -321.0: section is intensely sheared with several (<1cm) chloritic mylonite/microbreccia bands at 45°/CA

327.0 to 348.0: **LEUCOMONZOGRANITE:** medium -to coarse- grained, moderately equigranular, sheared, intense pervasive chloritization and hematization; common calcite veins and open vugs.

348.0 to 357.5: **MICROGRANITE:** light buff-orange, sharp contact with above, section contains several small(<5cm) shear-bounded fragments of above and pegmatite pods, mild moderate pervasive hematization.

357.5 to 359.0: **SHEAR ZONE:** brittle/ductile, characterized by intense pervasive chloritization and hematization; minor pyrite.

359.0 to 366.0: **BIOTITE MONZOGRANITE:** medium -to coarse- grained, moderately equigranular; several mylonite bands, intense pervasive hematization and fracture-controlled chloritization.

366.0 to 368.0: **LEUCOMONZOGRANITE:** fine -to medium- grained, moderately equigranular, sharp up-hole contact /sheared down-hole contact with biotite monzogranite.

368.0 to 449.0: **BIOTITE MONZOGRANITE:** medium -to coarse- grained, slightly megacrystic (<5%), mild to moderate pervasive saussuritization and hematization; common calcite veins and fracture/vug infillings
- 330-338'- zone of intense hematization
- 407-411'- calcite breccia
- 429-439'- calcite breccia
- 444-446'- leucomonzogranite dyke

449.0 to 451.0: **MICROGRANITE:** orange-pink, moderate pervasive hematization, in fault

contact with above and granodiorite below.

451.0 to 459.0: GRANODIORITE: medium -to coarse- grained, moderately equigranular, slightly megacrystic (<5%).

459.0 to 461.0: SHEAR ZONE: common calcite infilling vugs and tension gashes.

461.0 to 464.0: GRANODIORITE: medium -to coarse- grained, moderately equigranular, slightly megacrystic (<5%).

464.0 to 498.0: LEUCOMONZOGRANITE: fine -to medium- grained, moderately equigranular; mild to moderate pervasive saussuritization and hematization, common calcite veins at 45°/CA.

-498.0': END OF HOLE

BIPI-89-3 DESCRIPTIVE LOG

0.0 to 9.0: OVERBURDEN:

9.0 to 154.5: CUMULATE: medium to coarse grained, extremely megacrystic, light white-grey; well developed oscillatory zoning common in megacrysts; local intense pervasive desilicification, kaolinization and chloritization; accessory minerals include, cordierite, muscovite, biotite and rare garnet. Quartz can have a light green hue and is commonly intensely fractured. Cordierite (tr-4%) occurs as 1-2cm euhedral crystals which are commonly pinitized. Modal biotite generally <6% but may be enriched (20%) along discrete bands 2-10cm wide. Small (1-5cm) biotite-rich xenoliths are common with concentration from 114-154'; many are fish-shaped and oriented normal to CA. Rare calcite veins veins occur at 30°/CA.

- 9-36': feldspar laths display light mauve colouration of core area with white rims
- 20-24': zone of intense kaolinization of feldspar megacrysts
- 64-68': zone of intense desilicification and moderate kaolinization; core is very vuggy with no secondary infilling.
- 144-147': medium grained, moderately-eguigranular, biotite-monzogranite xenolith.

154.5 to 160.0: GRANODIORITE: medium to coarse grained, moderately equigranular, sharp contacts with cumulate; possible xenolith.

160.0 to 169.0: CUMULATE: extremely megacrystic,contains 10cm wide mafic porphyry and gneissic textured xenoliths. Contact with mafic porphyry marked by intense fracturing.

169.0 to 171.5: LEUCOMONZOGRANITE: medium grained, moderately equigranular, contact with cumulate marked by 1cm wide biotite-rich band.
intense fracture-controlled kaolinization (70°/CA).

171.5 to 179.0: CUMULATE: moderate to intense pervasive saussuritization. Feldspar and quartz are light-dark green. Section contains more biotite (8-10%) and is not as megacryst-rich as above cumulate. Numerous xenoliths.

179.0 to 198.7: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, with minor megacrysts (<5%). Contact with above marked by 2cm wide biotite-rich band (50°/CA) containing minor pyrrhotite, chalcopyrite and garnet. Feldspar and quartz have light-green colour and are intensely fractured.
Granodiorite xenoliths common. Section from 190-194'contains numerous small (<3mm) garnets in both plagioclase and biotite.

198.8 to 210.0: CUMULATE: megacrystic, mild-to moderate saussuritization of megacrysts; numerous xenoliths including large zoned calc-silicate (10cm). Contacts marked by xenoliths.

210.0 to 222.6: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), biotite (18-20%).

222.6 to 223.8: CUMULATE: megacrystic; megacrysts light-grey to dark grey-green; contacts with granodiorite are sharp and marked by xenoliths.

223.8 to 225.0: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), narrow (<1cm) calcite veins at 45°/CA.

225.0 to 239.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), minor cordierite and rare garnet.
- 229'- 1' wide aplite dyke containing large bladed biotite

239.0 to 241.5: CUMULATE: megacrystic; mild to moderate pervasive suassuritization; 1cm wide calcite vein (20°/CA) at 239.2'.

241.5 to 250.0: GRANODIORITE: medium -to coarse- grained, moderately equigranular with minor megacrysts (<5%), biotite (15-25%). Contact with cumulate sharp and marked by 10cm wide biotite-rich band at 45°/CA. Interval contains 1'(243-244) section of porphyritic-biotite monzogranite marked by sharp contacts. Small granodiorite xenoliths occur in porphyry.
- 246.5'- two shear bands (<1cm) approx. 5cm apart (50°/CA) associated with intense chloritization, granodiorite between the shears displays intense ductile deformation.

250.0 to 253.8: BIOTITE MONZOGRANITE: porphyritic, biotite (8-10%), rare garnet; sharp contacts with granodiorite.

253.8 to 265.0: GRANODIORITE: medium -to coarse-grained, moderately equigranular with minor megacrysts (<5%). Section contains several extremely biotite-rich (40-60%) bands at 50°/CA (263-264.5').

265.0 to 283.0: LEUCOMONZOGRANITE: porphyritic, contains 1-2% small (<5mm) cordierite and reddish-brown garnet. The latter commonly display a mafic-free halo.
10cm wide biotite-rich granodiorite xenolith cross-cut by 1cm calcite vein at 20°/CA (282.5').

283.0 to 332.0: BIOTITE MONZOGRANITE: medium grained, moderately equigranular, to slightly-porphyritic, local compositional variation to leucomonzogranite; cordierite (1-2%), rare garnet. Numerous granodiorite xenoliths 10-25cm wide. Several
calcite veins 30°/CA.

332.0 to 458.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%); calcite fracture filling common. Mild-moderate pervasive saussuritization. Contact with above marked by 2 cm. aplite band. Small metasediment xenoliths common.

- 336',337', 396.5'- pegmatite pod/dyke 65°/CA
- 404'- 1cm wide mylonite band 20°/CA
- 446'- 20cm wide biotite-depletion zone
- 450'- 8cm wide zone of desilicification and chloritization

458.0 to 545.0: **BIOTITE MONZOGRANITE:** medium grained, moderately equigranular. Section contains more muscovite (1-2%) with common, cordierite, garnet and granodiorite xenoliths (478-483').
-491'- 6cm wide pegmatite dyke containing black tourmaline and minor fluorite and chlorite
-499.8'- 5cm wide pegmatite dyke

545.0 to 561.0: **GRANODIORITE:** medium to coarse grained, moderately equigranular with minor megacrysts (<5%), contact with above marked by 10cm wide chill margin.

561.0 to 609.0: **CUMULATE:** megacrystic; 10cm wide zone of desilicification and chloritization at 608'. Biotite-rich bands at 600'/607'.

609.0 to 624.0: **BIOTITE MONZOGRANITE:** medium to coarse grained, moderately equigranular with minor megacrysts (<5%).

624.0 to 667.0: **CUMULATE:** megacrystic; section contains several zones of biotite enrichment (632-640') and desilicification and chloritization (655-660').

667.0 to 731.0: **GRANODIORITE:** medium grained, moderately equigranular, section contains numerous small (<5cm) metasedimentary xenoliths.
- 667-683'- biotite-enriched zone
- 694'- 30 cm long calcite vein at 30°/CA

731.0 to 779.0: **BIOTITE MONZOGRANITE:** medium to coarse grained, slightly megacrystic (<5%), locally leucomonzogranite in composition; mild to moderate pervasive saussuritization and chloritization; rare (<5mm) garnets crystals and calcite veins at 45°/CA
- 738'- 2 narrow (5cm) pegmatite dykes
- 766'- 15cm microgranite dyke containing abundant small red garnets

779.0 to 781.0; **MICROGRANITE:** fine-to medium-grained equigranular; contains 1-2% small (<2mm) garnets. Contact with above marked by large (1cm) garnets.

781.0 to 804.5: **BIOTITE MONZOGRANITE:** medium-to coarse-grained, slightly megacrystic; mild to moderate pervasive alteration.

804.5 to 929.0: **GRANODIORITE:** medium -to coarse- grained, slightly megacrystic (<5%), massive with little jointing, numerous xenoliths.
- 926': 3cm wide pegmatite dyke at 90°/CA

929.0 to 930.0: BIOTITE MONZOGRANITE: medium -to coarse- grained, slightly megacrystic (<5%).

930.0 to 937.0: GRANODIORITE: medium -to coarse-grained, slightly megacrystic (<5%).

937.0 to 965.0: BIOTITE MONZOGRANITE: medium -to coarse- grained, slightly megacrystic (<5%), section contains local zones of biotite enrichment and depletion. Mild to moderate pervasive saussuritization and chloritization. Rare garnet.

965.0 to 976.5: GRANODIORITE: medium -to coarse-grained, slightly megacrystic (<5%), contact with above marked by quartz vein.

976.5 to 999.0: BIOTITE MONZOGRANITE: medium -to coarse-grained, slightly megacrystic (<5%), rare garnet with noticable enrichment at 994'. Contact with granodiorite below marked by 5cm chill margin (porphyry-textured) at 40°/CA.

999.0 to 1013.0: GRANODIORITE: medium -to coarse- grained, slightly megacrystic (<5%).

1007.0 to 1010.0: BIOTITE MONZOGRANITE: medium grained, moderately equigranular, sharp contacts with granodiorite.

1013.0 to 1014.0: BIOTITE MONZOGRANITE: porphyritic.

1014.0 to 1018.0: GRANODIORITE: medium -to coarse- grained, slightly megacrystic (<5%), contacts with biotite-monzogranite at 40°/CA.

1018.0 to 1031.5: BIOTITE MONZOGRANITE: medium -to coarse- grained, megacrystic. Rare garnet. Contact with below marked by 20cm wide porphyry-textured zone.

1031.5 to 1050.5: GRANODIORITE: medium -to coarse- grained, slightly megacrystic (<5%), small xenoliths.

1050.5 to 1059.0: LEUCOMONZOGRANITE: medium grained, moderately equigranular, mild to moderate pervasive chloritization; small (<3mm) garnets common.
- 1058'- 15cm aplite/pegmatite dyke containing abundant very small (<2mm) garnets with concentration at contact with above

1059.0 to 1080.0: GRANODIORITE: medium -to coarse- grained, slightly megacrystic (<5%); contact with below marked by biotite-rich band.

1080.0 to 1101.0: LEUCOMONZOGRANITE: medium -to coarse-grained, moderately equigranular, rare garnet crystals.

1101.0 to 1106.0: GRANODIORITE: medium -to coarse-grained, slightly megacrystic (<5%); in sharp contact with above.

1106.0 to 1124.0: LEUCOMONZOGRANITE: medium -to coarse- grained, slightly megacrystic (<5%), section contains several granodiorite xenoliths; 10cm wide zone of garnet enrichment at 1122'.

1124.0 to 1140.0: GRANODIORITE: medium -to coarse-grained, slightly megacrystic (<5%).

1140.0 to 1151.0: BIOTITE MONZOGRANITE: medium -to coarse- grained, moderately equigranular.

1151.0 to 1320.0: GRANODIORITE: medium -to coarse-grained, slightly megacrystic (<5%); section contains 2 large (10cm) mafic porphyry xenoliths; also several narrow shear bands at 30°/CA associated with calcite veins and intense fracture-controlled K-feldspathization and chloritization.

1320.0 to 1353.0: LEUCOMONZOGRANITE: medium -to coarse-grained, moderately equigranular, minor garnet; moderate to intense pervasive saussuritization and chloritization, moderate fracture controlled K-feldspathization.
-1337.0 - 1341.0'- BRECCIA: abundant calcite veins, with minor pyrite disseminations, intense pervasive K-feldspathization.

1353.0 to 1405.5: LEUCOMONZOGRANITE: fine -to medium-grained, moderately equigranular, locally, medium -to coarse-grained, slightly megacrystic
(<5%), minor garnet, moderate to intense pervasive K-feldspathization; numerous bleached fractures at 30°/CA; microgranite dykes (<15cm) containing minor garnet at 1375'and 1392'.

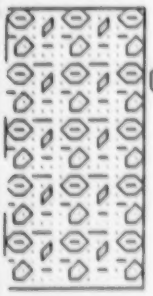
1405.5 to 1544.0: LEUCOMONZOGRANITE: medium -to coarse-grained, moderately equigranular, mild to locally intense saussuritization, chloritization and K-feldspathization. Section contains several narrow garnet-bearing microgranite dykes and pegmatite/aplite segregations.
- 1427-1431'; intensely fractured
- 1525-1528'; intercalated biotite-rich and garnet-rich bands.

1544.0': END OF HOLE

GRAPHIC

LOGS

LEGEND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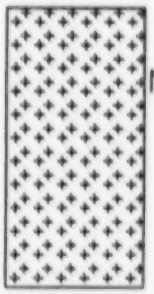
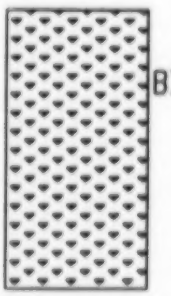

MU-BI MONZ.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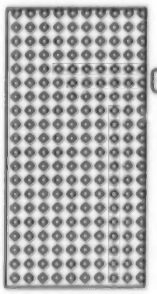
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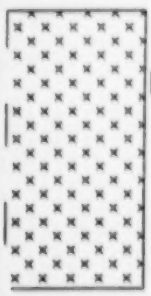
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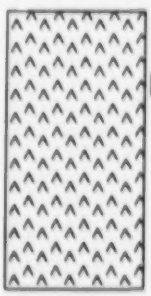
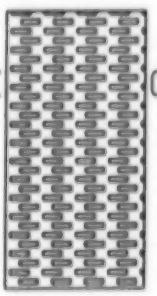
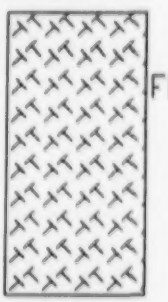

LEUCOGRANITE

MICROGRANITE


CUMULATE

BRECCIA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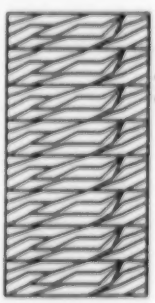
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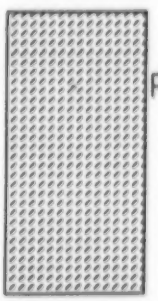
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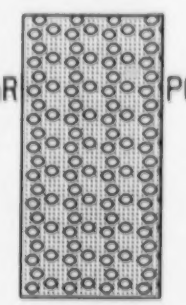
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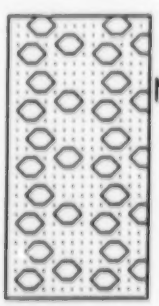
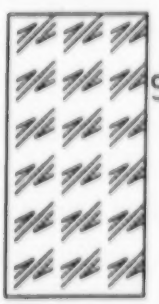
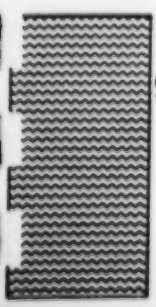

MEGACRYSTIC


SHEARED


SHEAR ZONE

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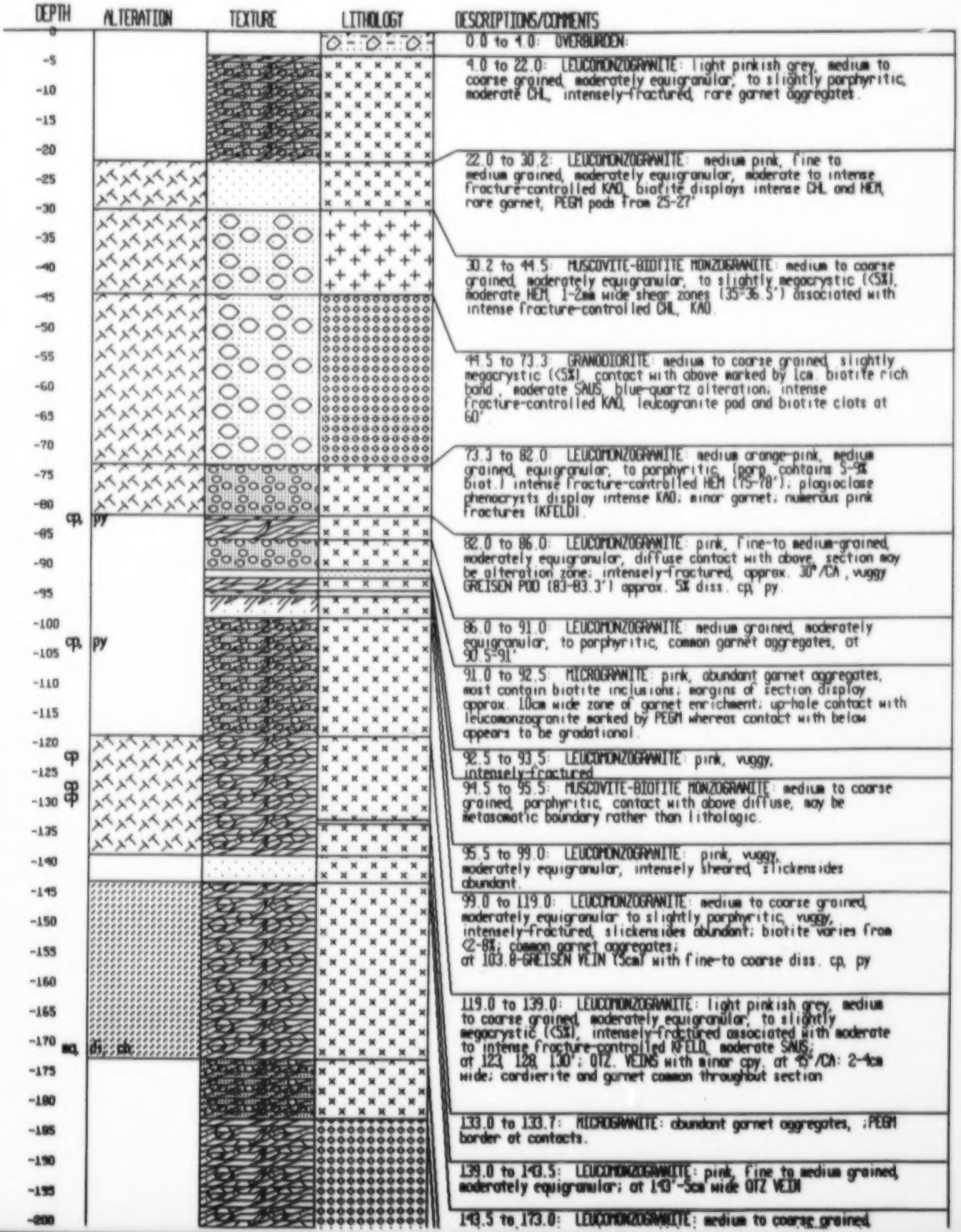
DEPTH
ALTERATION
TEXTURE
LITHOLOGY
DESCRIPTIONS/COMMENTS
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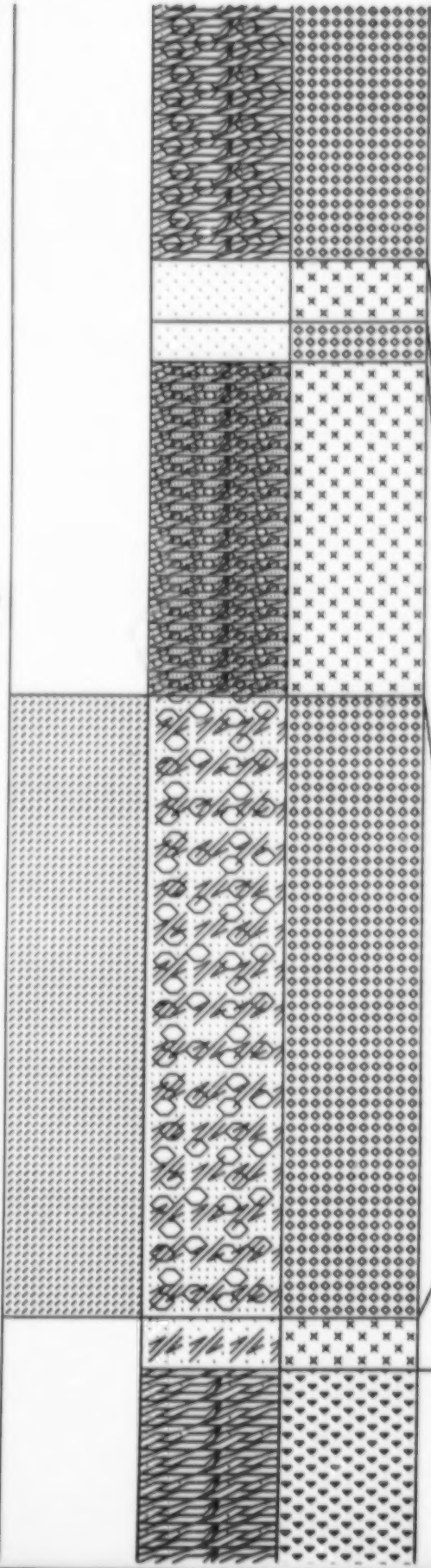
cp, py
cp, py
cp
cp
sq
di, chl
0.0 to 4.0: OVERBURDEN:
4.0 to 22.0: LEUCOMONZOGRANITE: light pinkish grey, medium to coarse grained, moderately equigranular, to slightly porphyritic, moderate CHL, intensely-fractured, rare garnet aggregates.
22.0 to 30.2: LEUCOMONZOGRANITE: medium pink, fine to medium grained, moderately equigranular, moderate to intense fracture-controlled KAO, biotite displays intense CHL and HEM, rare garnet, PEGM pods from 25-27'
30.2 to 44.5: MUSCOVITE-BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, to slightly megacrystic (<5%), moderate HEM, 1-2mm wide shear zones (35'-36.5') associated with intense fracture-controlled CHL, KAO.
44.5 to 73.3: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), contact with above marked by 1cm biotite rich band, moderate SAUS, blue-quartz alteration; intense fracture-controlled KAO, leucogranite pod and biotite clots at 60'
73.3 to 82.0: LEUCOMONZOGRANITE: medium orange-pink, medium grained, equigranular, to porphyritic, (pors. contains 5-9% biot.) intense fracture-controlled HEM (75-78'); plagioclase phenocrysts display intense KAO; minor garnet; numerous pink fractures (KFELD).
82.0 to 86.0: LEUCOMONZOGRANITE: pink, fine-to medium-grained, moderately equigranular, diffuse contact with above, section may be alteration zone; intensely-fractured, approx. 30°/CA, vuggy GREISEN POD (83-83.3') approx. 5% diss. cp, py.
86.0 to 91.0: LEUCOMONZOGRANITE: medium grained, moderately equigranular, to porphyritic, common garnet aggregates, at 90.5-91'
91.0 to 92.5: MICROGRANITE: pink, abundant garnet aggregates, most contain biotite inclusions; margins of section display approx. 10cm wide zone of garnet enrichment; up-hole contact with leucomonzogranite marked by PEGM whereas contact with below appears to be gradational.
92.5 to 93.5: LEUCOMONZOGRANITE: pink, vuggy, intensely-fractured
94.5 to 95.5: MUSCOVITE-BIOTITE MONZOGRANITE: medium to coarse grained, porphyritic, contact with above diffuse, may be metasomatic boundary rather than lithologic.
95.5 to 99.0: LEUCOMONZOGRANITE: pink, vuggy, moderately equigranular, intensely sheared, slickensides abundant.
99.0 to 119.0: LEUCOMONZOGRANITE: medium to coarse grained, moderately equigranular to slightly porphyritic, vuggy, intensely-fractured, slickensides abundant; biotite varies from <2-8%; common garnet aggregates;
at 103.8-GREISEN VEIN (5cm) with fine-to coarse diss. cp, py
119.0 to 139.0: LEUCOMONZOGRANITE: light pinkish grey, medium to coarse grained, moderately equigranular, to slightly megacrystic (<5%), intensely-fractured associated with moderate to intense fracture-controlled KFELD, moderate SAUS;
at 123, 128, 130': QTZ. VEINS with minor cpy, at 45°/CA: 2-4cm wide; cordierite and garnet common throughout section
133.0 to 133.7: MICROGRANITE: abundant garnet aggregates, ±PEGM border at contacts.
139.0 to 143.5: LEUCOMONZOGRANITE: pink, fine to medium grained, moderately equigranular; at 143'-5cm wide QTZ VEIN
143.5 to 173.0: LEUCOMONZOGRANITE: medium to coarse grained,



139.0 to 143.5: LEUCOMONZOGRANITE: pink, fine to medium grained, moderately equigranular; at 140'-3cm wide QTZ VEIN

143.5 to 173.0: LEUCOMONZOGRANITE: medium to coarse grained, moderately equigranular, to slightly megacrystic (<5%): moderate to intense pervasive SILIC, KFELD; common cordierite, rare garnet except for coarse aggregates within and adjacent to alteration zones (145-150.5'; 160';167.7-170.5'); section is moderately to intensely-fractured laylonite band at 172')- followed by 15cm of abundant disseminated Cu mineralization (malachite, diginite, chrysocolla).

173.0 to 183.0: LEUCOMONZOGRANITE: light orange, pink, medium to coarse grained, moderately equigranular, to slightly porphyritic, moderately to intensely-fractured; mylonite bands at 177.5'; rare garnet

183.0 to 224.5: GRANODIORITE: medium to coarse grained, moderately equigranular, slightly megacrystic (<5%), blue-quartz, biotite (12-18%) moderate SAUS of plagioclase; moderate to intensely-fractured (194-200').

224.5 to 233.0: LEUCOMONZOGRANITE: buff orange, medium to coarse grained, moderately equigranular, sharp contact with granodiorite; no garnet; several thin calcite-bearing fractures in section.

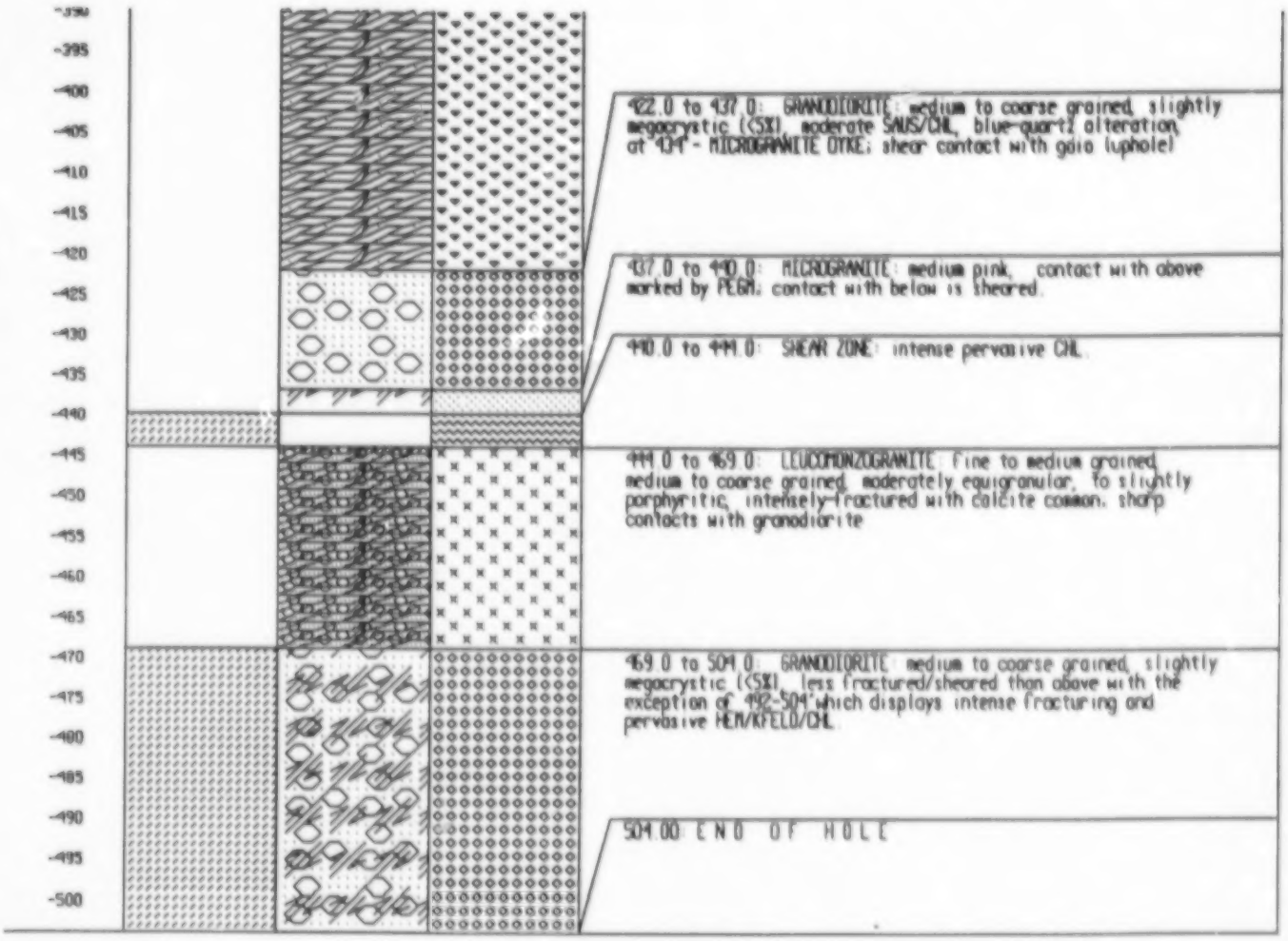
233.0 to 238.5: GRANODIORITE: medium to coarse grained, moderately equigranular, moderate SAUS, blue-quartz, sharp contact with above leucogranite.

238.5 to 284.0: LEUCOMONZOGRANITE: light grey, pinkish grey, fine to medium grained, moderately equigranular, to slightly porphyritic; intensely-fractured; in sharp contact with granodiorite, garnet absent.
at 269': c.a. PEGM pod (5cm), minor diss. cp within biotite clots
at 269.5-271.5': granodiorite xenolith, intensely fractured, calcite veinlets, contact above is sharp
at 271.5'- 3cm wide qtz-sericite band with cp/cc at contact with granodiorite
at 274.5-277.5': granodiorite xenolith, downhole contact with leucomonzogranite is offset approx. 3 cm.

284.0 to 368.0: GRANODIORITE: medium-to coarse-grained, slightly megacrystic (<5%), blue-quartz, intensely sheared (commonly 0-30°/CA) with common slickensides, and calcite; intense-pervasive CHL/SAUS
at 285-289'- zone of intense shearing, numerous thin mylonite bands
at 295.5'- 25 cm wide zone of intense shearing/deformation
at 300-304'- intensely fractured; several granodiorite xenoliths surrounded by rim of graphic granite/myraelite
at 312-318'- intensely sheared with thin mylonite bands, most show offset along fractures; intense pervasive CHL/SAUS
at 328.5'- several 1cm. wide mylonite bands; very intense CHL
at 340-344.5'- intensely sheared with mylonite bands
at 354-357'- very intense shearing, 10cm wide crush breccia (354.5') with calcite cement

368.0 to 375.0: LEUCOMONZOGRANITE: light buff-orange, fine-to medium-grained moderately equigranular; intense shearing, numerous mm. black bands (biot?); sheared contact with granodiorite.

375.0 to 422.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, intensely-fractured ; biot.16-8% biaggal:
at 381.5-383'- granodiorite xenolith with APPEGM, contact with below marked by 10cm wide band of >25% biotite.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422.0 to 437.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), moderate SAUS/CHL, blue-quartz alteration, at 434' - MICROGRANITE DYKE; shear contact with gaia (upholel
437.0 to 440.0: MICROGRANITE: medium pink, contact with above marked by PEGM. contact with below is sheared.
440.0 to 444.0: SHEAR ZONE: intense pervasive CHL.
444.0 to 469.0: LEUCOMONZOGRANITE: fine to medium grained, medium to coarse grained, moderately equigranular, to slightly porphyritic, intensely fractured with calcite common, sharp contacts with granodiorite
469.0 to 504.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), less fractured/sheared than above with the exception of 492-504' which displays intense fracturing and pervasive HEM/KFELD/CHL.
504.00: E N D O F H O L E

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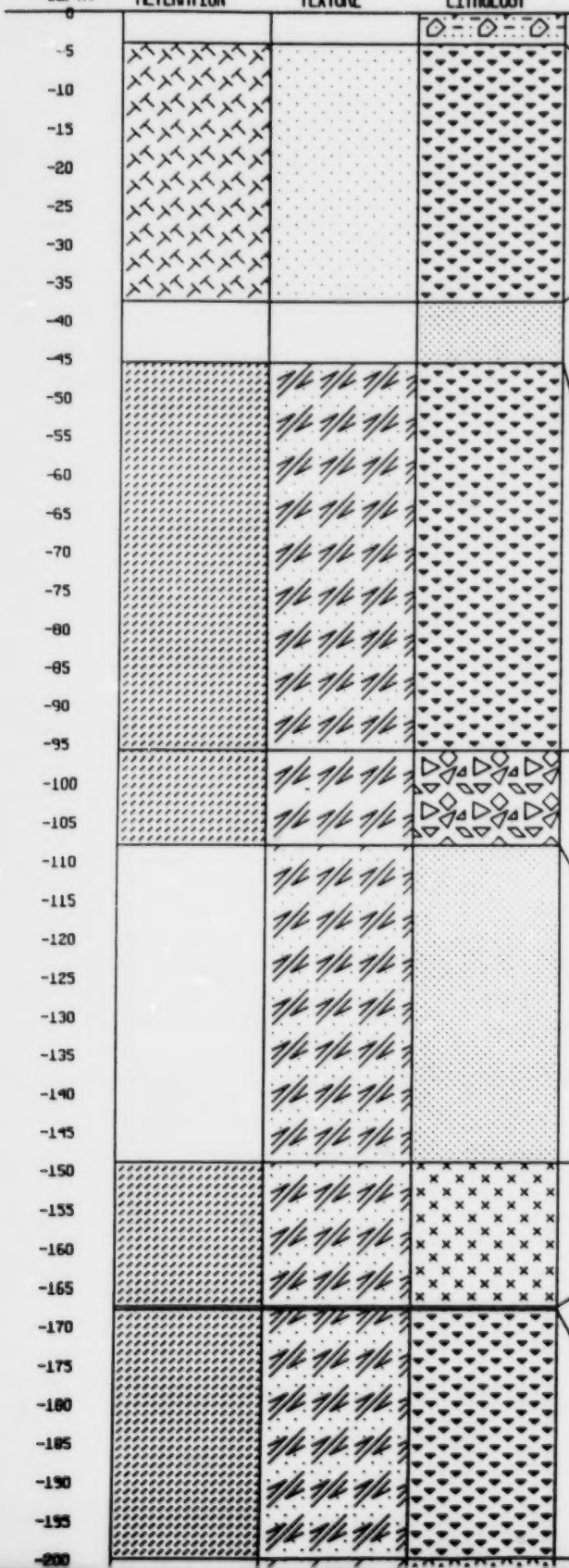


0.0 to -4.0: OVERBURDEN:

-4.0 to -37.5: BIOTITE MONZOGRANITE: medium grained, moderately equigranular, moderate to intense CHL of biotite, K-feldspar chalky white (KAO) with moderate HEM, fracture-controlled HEM/KAO, minor manganese-oxide blebs.
at 10'-25'- intense hematization,
at 20-24'- hematite breccia, core extremely friable, possible fluid breccia

-37.5 to -45.5: MICROGRANITE: dyke, in sharp contact with above, contains many small 1-2mm pale-pink to deep red-orange garnets (not always surrounded by leucocratic halo), several small PEGM pods at 38'.

-45.5 to -108.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular;
45.5-69'- mild CHL/HEM
47'- 10 cm. microgranite dyke with abundant small garnets
71'- 10 cm intensely fractured/sheared
77.8'-intense pervasive HEM

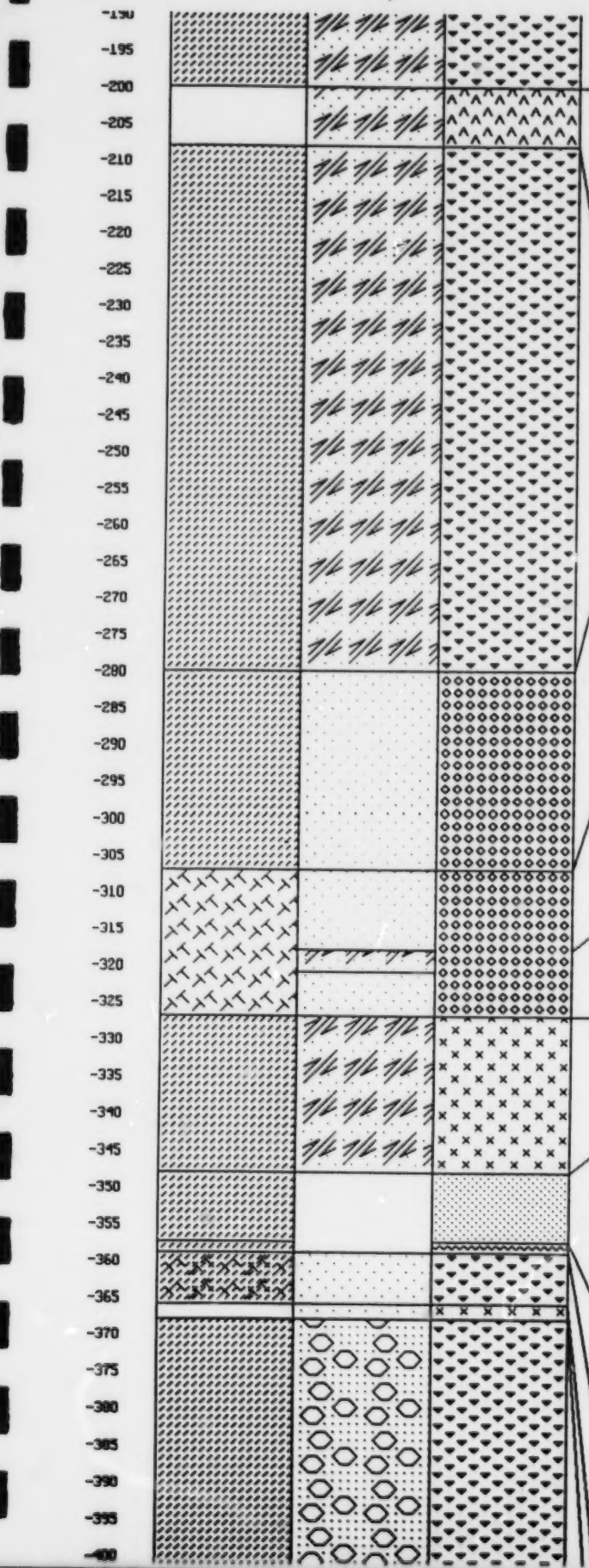
-96.0 to -108.0: CALCITE BRECCIA: intense-pervasive HEM/CHL/KAO, intensely sheared

-108.0 to -149.0: MICROGRANITE: fine grained, equigranular, light orange, pink, minor garnet aggregates; intensely sheared (at 45 C/A), brittle/ductile deformation.
139-143'-zone of high alumina alteration with intense HEM/CHL, core very friable, finely diss. py
144-149'-intense brittle deformation, numerous open vugs/cavities assoc. with fractures, intense DES/KFELD; section contains leucomonzogranite clasts

-149.0 to -167.5: LEUCOMONZOGRANITE: medium grained moderately equigranular, intensely sheared; both brittle and ductile deformation, minor displacement along shear planes; section contains intense pervasive HEM.

-167.5 to -168.0: SHEAR ZONE:

-168.0 to -200.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, sheared, intense pervasive CHL/HEM, open vugs;
180-182': intensely-sheared with tension-gashes



-200.0 to -208.0: LEUCOGRANITE: fine to medium grained, moderately equigranular, sheared, medium orange, red; tension gashes common.

-208.0 to -280.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, sheared with tension gashes, moderate to intense pervasive CHL/HEM/KAO; contact with above marked by 15 cm wide biotite-rich shear band/crush breccia; minor calcite veins

-280.0 to -307.0: GRANODIORITE: medium to coarse grained, moderately equigranular, biot (10-15%); intense pervasive CHL/HEM/KAO/CARB, core is broken and extremely friable, common calcite veins

-307.0 to -327.0: GRANODIORITE: medium to coarse grained, moderately equigranular, mild to moderate fracture-controlled SAUS/CHL/HEM, common calcite veins, fault-contact with leucomonzogranite @ 327'

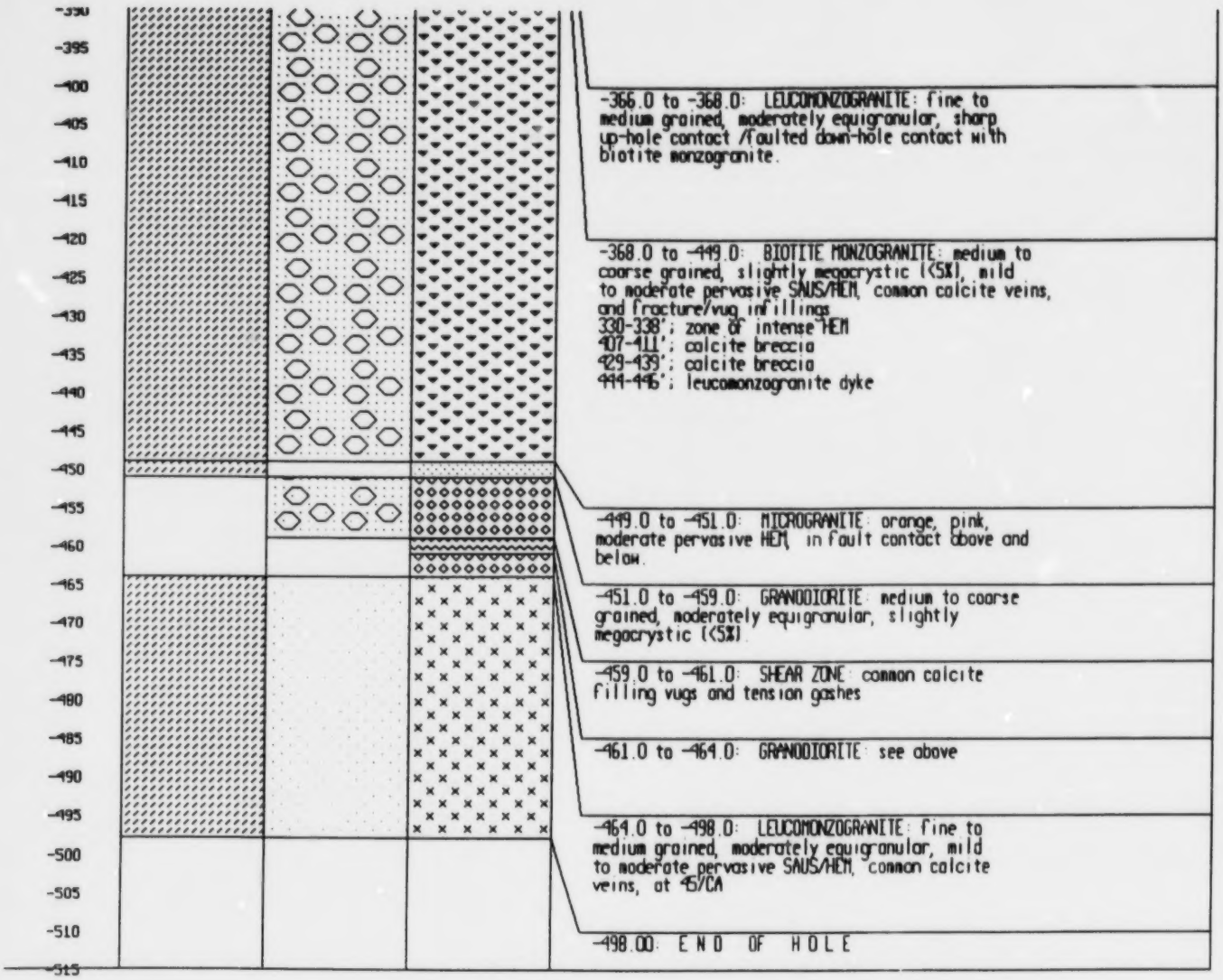
-318.0 to -321.0: section is intensely sheared with several (<1cm) chloritic mylonite/microbreccia bands at 45/CA

-327.0 to -348.0: LEUCOMONZOGRANITE: medium to coarse grained, moderately equigranular, sheared, intense pervasive CHL/HEM, common calcite veins, partially filled vugs.

-348.0 to -357.5: MICROGRANITE: light buff orange, in sharp up-hole contact with above, section contains several small(5cm) shear-bounded fragments of above leucomonzogranite and PEGM pods, mild moderate pervasive hematization.

-357.5 to -359.0: SHEAR ZONE: mylonite, brittle deformation, intense pervasive CHL/HEM, marks contact of microgranite/biotite monzogranite, minor py

-359.0 to -366.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, several mylonite bands, intense pervasive HEM and fracture-controlled CHL.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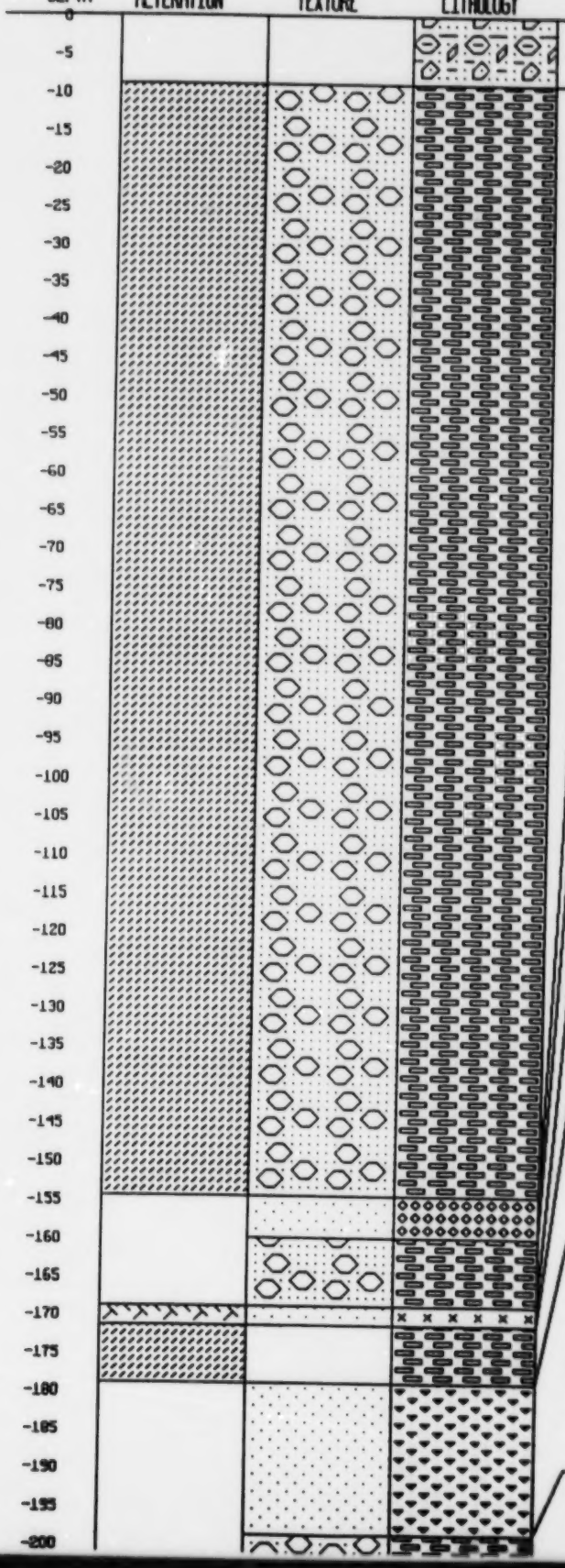
-366.0 to -368.0: LEUCOMONZOGRANITE: fine to medium grained, moderately equigranular, sharp up-hole contact /faulted down-hole contact with biotite monzogranite.
-368.0 to -449.0: BIOTITE MONZOGRANITE: medium to coarse grained, slightly megacrystic (<5%), mild to moderate pervasive SAUS/HEM, common calcite veins, and fracture/vug infillings
330-338'; zone of intense HEM
407-411'; calcite breccia
429-439'; calcite breccia
444-446'; leucomonzogranite dyke
-449.0 to -451.0: MICROGRANITE: orange, pink, moderate pervasive HEM, in fault contact above and below.
-451.0 to -459.0: GRANODIORITE: medium to coarse grained, moderately equigranular, slightly megacrystic (<5%).
-459.0 to -461.0: SHEAR ZONE: common calcite filling vugs and tension gashes
-461.0 to -464.0: GRANODIORITE: see above
-464.0 to -498.0: LEUCOMONZOGRANITE: fine to medium grained, moderately equigranular, mild to moderate pervasive SAUS/HEM, common calcite veins, at 45/CA
-498.00: E N D O F H O L E

BIPI-89-3



DESCRIPTIONS/COMMENTS

0.0 to -9.0: OVERBURDEN:

-9.0 to -154.5: CUMULATE: medium to coarse grained, extremely megacrystic, light white-grey; well developed oscillatory zoning common in megacrysts; local intense pervasive DES, KAO, BIO and CHL; accessory minerals include, cordierite muscovite, biotite and rare garnet. Quartz can have a light green hue and is commonly intensely fractured. Cordierite (tr-4%) occurs as 1-2cm euhedral crystals which are commonly pinitized. Modal biotite generally <6% but may be enriched (20%) along discrete bands 2-10cm wide. Small (1-5cm) biotite-rich xenoliths are common with concentration from 114-154'; many are fish-shaped and oriented normal to CA. Rare calcite veins veins occur at 30°/CA.

9-36': feldspar laths display light mauve colouration of core area with white rims
20-24': zone of intense KAO of feldspar megacrysts
64-68': zone of intense DES and moderate KAO; core is very vuggy with no secondary infilling
144-147': m.g. moderately-equigranular, biotite-monzogranite xenolith; diffuse contacts

-154.5 to -160.0: GRANODIORITE: medium to coarse grained, moderately equigranular, sharp contacts with cumulate, possible xenolith

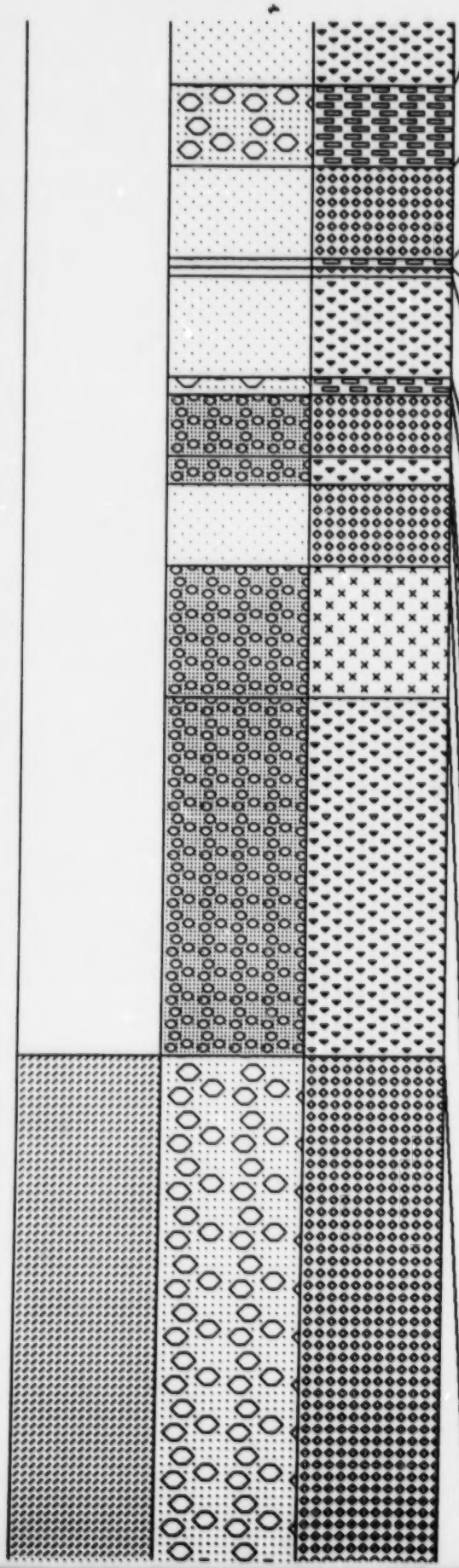
-160.0 to -169.0: CUMULATE: extremely megacrystic, contains 10cm wide mafic porphyry and gneissic textured xenoliths. Contact with mafic porphyry marked by intense fracturing.

-169.0 to -171.5: LEUCOMONZOGRANITE: medium grained, moderately equigranular, contact with cumulate marked by 1cm wide biotite-rich band. intense fracture-controlled KAO. (70°/CA).

-171.5 to -179.0: CUMULATE: moderate to intense pervasive SAUS. Feldspar and quartz are light-dark green. Section contains more biotite (8-10%) and is not as megacryst-rich as above cumulate. Numerous xenoliths.

-179.0 to -198.7: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular, with minor megacrysts (<5%). Contact with above marked by 2cm wide biotite-rich band (50°/CA) containing minor po, cp, gt. Feldspar and quartz have light-green colour and are intensely fractured. Granodiorite xenoliths common. Section from 190-194' contains numerous small (<3mm) garnets in both plagioclase and biotite.

-198.8 to -210.0: CUMULATE: megacrystic, mild-to moderate SAUS of megacrysts; numerous xenoliths including large zoned calc-silicate (10cm). Contacts marked by xenoliths.



-198.8 to -210.0: CUMULATE: megacrystic, mild-to moderate SAUS of megacrysts; numerous xenoliths including large zoned calc-silicate (10cm). Contacts marked by xenoliths.

-210.0 to -222.6: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), biotite (18-20%).

-222.6 to -223.8: CUMULATE: megacrystic; megacrysts light-grey to dark grey-green; contacts with granodiorite are sharp and marked by xenoliths.

-223.8 to -225.0: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), narrow (<1cm) calcite veins at 45°/CA.

-225.0 to -239.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), minor cordierite and rare garnet.
229': 1' wide aplite dyke containing large bladed biotite

-239.0 to -241.5: CUMULATE: megacrystic; mild - moderate SAUS, 1cm wide calcite vein (20°/CA) at 239.2'.

-241.5 to -250.0: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%), biotite (15-25%). Contact with cumulate sharp and marked by 10cm wide biotite-rich band at 45°/CA. Interval contains 1' (243-244) section of porphyritic-biotite monzogranite marked by sharp contacts. Small granodiorite xenoliths occur in porphyry.
246.5': two shear bands (<1cm) approx. 5cm apart (50°/CA) assoc. with intense CHL/SAUS; granodiorite between the shears displays intense ductile deformation.

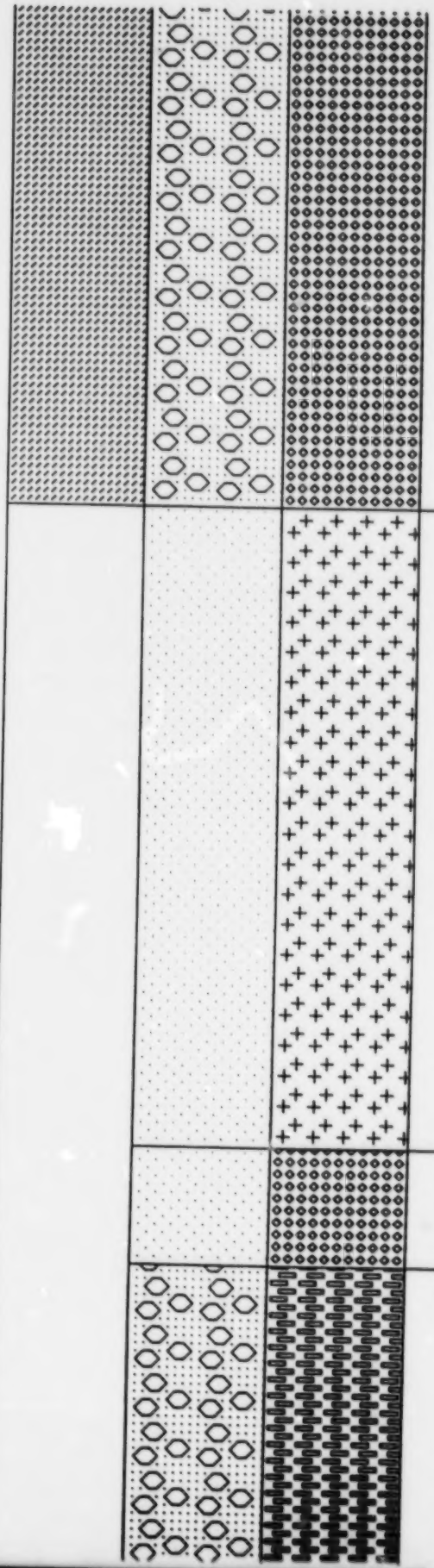
-250.0 to -253.8: BIOTITE MONZOGRANITE: porphyritic, biotite (8-10%), rare garnet; sharp contacts with granodiorite.

-253.8 to -265.0: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%). Section contains several extremely biotite-rich (40-60%) bands at 50°/CA (263-264.5').

-265.0 to -283.0: LEUCOMONZOGRANITE: porphyritic; contains 1-2% small (<5mm) cordierite and reddish-brown garnet. The latter commonly display a mafic-free halo. 10cm wide biotite-rich granodiorite xenolith cross-cut by 1cm calcite vein at 20°/CA (282.5').

-283.0 to -332.0: BIOTITE MONZOGRANITE: medium grained, moderately equigranular, to slightly-porphyritic, local compositional variation to leuco-monzogranite; cordierite (1-2%), rare garnet. Numerous granodiorite xenoliths 10-25cm wide. Several calcite veins 30°/CA.

-332.0 to -400.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), ; calcite

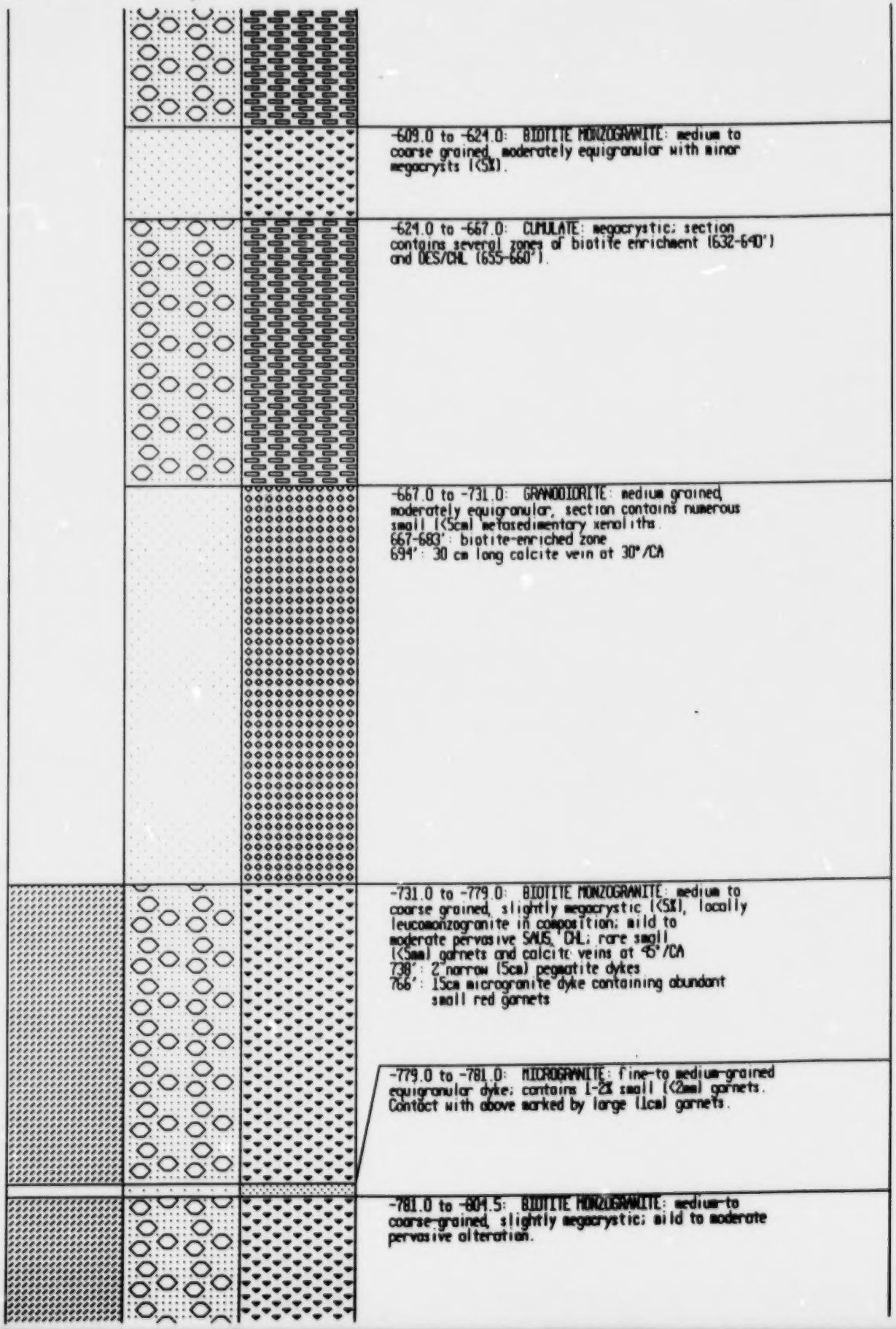


-332.0 to -458.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (5%), ; calcite fracture filling common. Mild-moderate pervasive SAUS. Contact with above marked by 2 cm. aplite band. Small metasediment xenoliths common.
- 336', 337', 396.5': pegmatite pod/dyke 65°/CA
- 404': 1cm wide mylonite band 20°/CA
- 416': 20cm wide biotite-depletion zone
- 450': 8cm wide DES/CHL zone

-458.0 to -545.0: MUSCOVITE-BIOTITE MONZOGRANITE: medium grained, moderately equigranular. Section contains common, cordierite, garnet and granodiorite xenoliths (478-483').
-491': 6cm wide pegmatite dyke containing black tourmaline and minor fluorite and chlorite
-499.8': 5cm wide pegmatite dyke

-545.0 to -561.0: GRANODIORITE: medium to coarse grained, moderately equigranular with minor megacrysts (5%), contact with above marked by 10cm wide chill margin.

-561.0 to -609.0: CUMULATE: megacrystic; 10cm wide DES/CHL zone at 608'. Biotite-rich bands at 600'/607'.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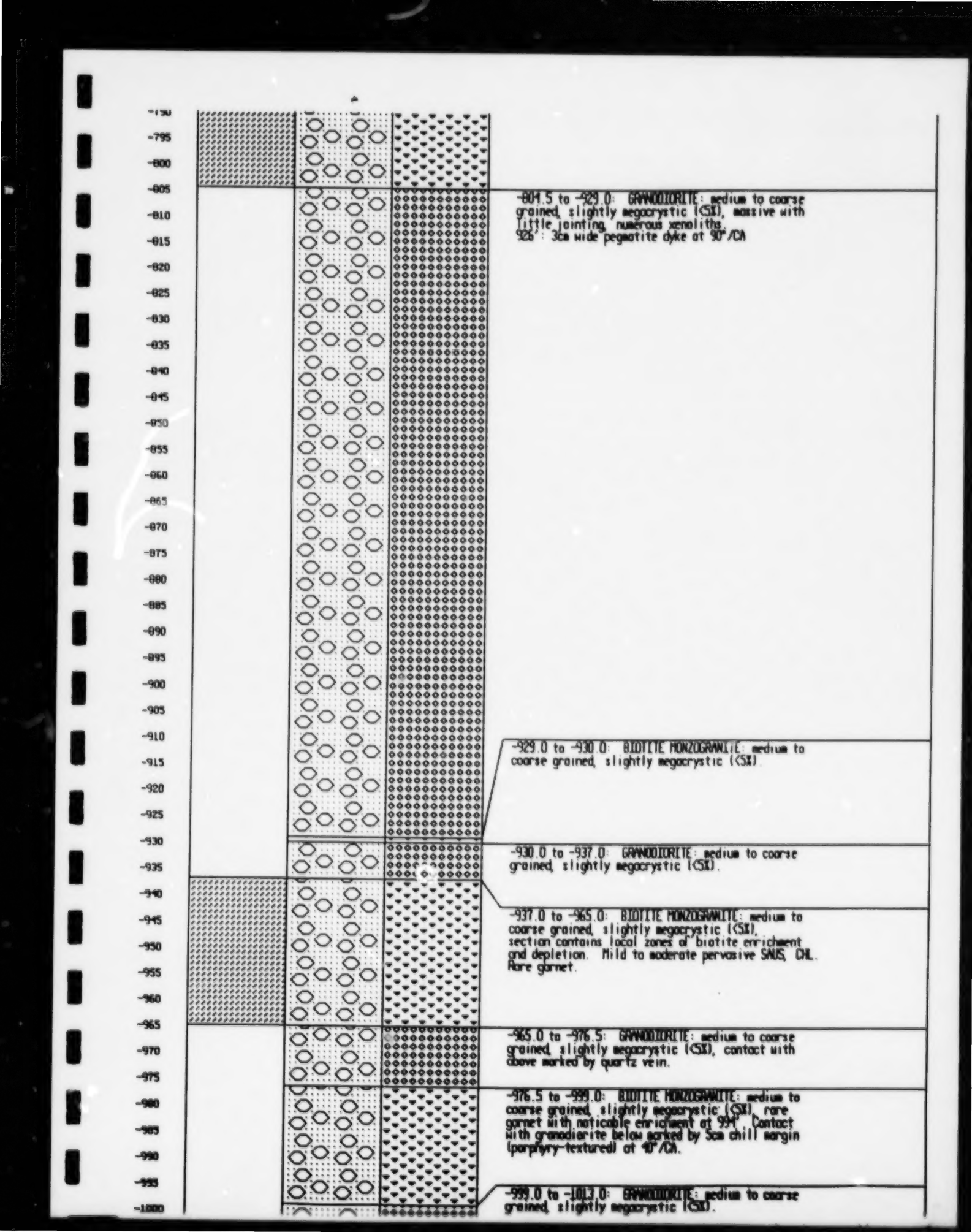
-609.0 to -624.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular with minor megacrysts (<5%).
-624.0 to -667.0: CUMULATE: megacrystic; section contains several zones of biotite enrichment (632-640') and OES/CHL (655-660').
-667.0 to -731.0: GRANODIORITE: medium grained, moderately equigranular, section contains numerous small (<5cm) metasedimentary xenoliths.
667-683': biotite-enriched zone
694': 30 cm long calcite vein at 30°/CA
-731.0 to -779.0: BIOTITE MONZOGRANITE: medium to coarse grained, slightly megacrystic (<5%), locally leucomonzogranite in composition; mild to moderate pervasive SAUS, CHL; rare small (<5mm) garnets and calcite veins at 45°/CA
738': 2' narrow (5cm) pegmatite dykes
766': 15cm microgranite dyke containing abundant small red garnets
-779.0 to -781.0: MICROGRANITE: fine-to medium-grained equigranular dyke; contains 1-2% small (<2mm) garnets. Contact with above marked by large (1cm) garnets.
-781.0 to -804.5: BIOTITE MONZOGRANITE: medium-to coarse-grained, slightly megacrystic; mild to moderate pervasive alteration.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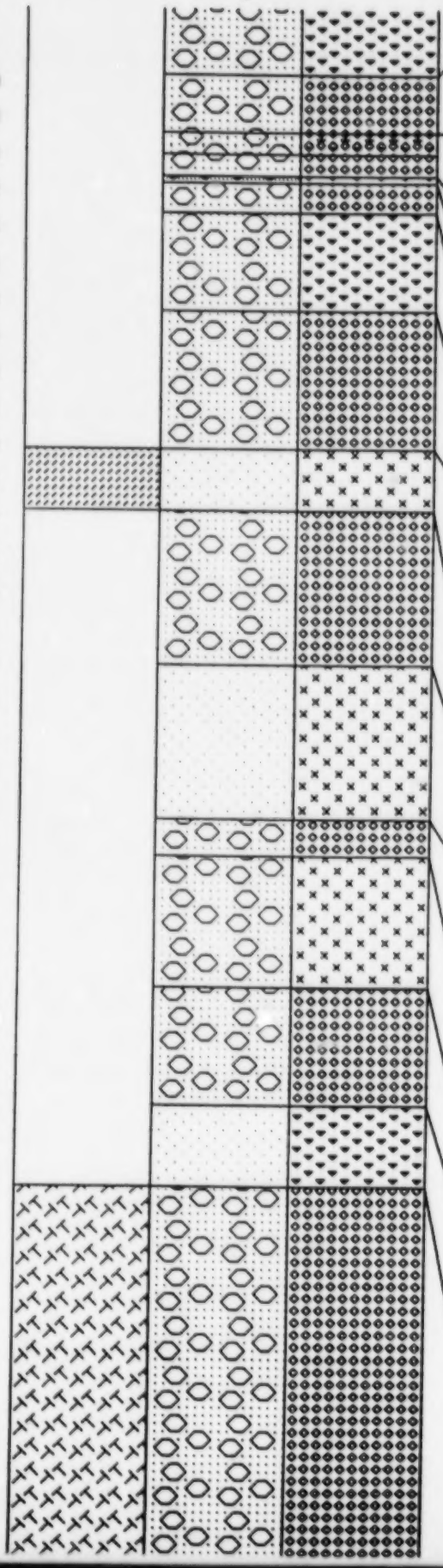
-804.5 to -929.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), massive with little jointing, numerous xenoliths.
926': 3cm wide pegmatite dyke at 90°/CA
-929.0 to -930.0: BIOTITE MONZOGRANITE: medium to coarse grained, slightly megacrystic (<5%).
-930.0 to -937.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%).
-937.0 to -965.0: BIOTITE MONZOGRANITE: medium to coarse grained, slightly megacrystic (<5%), section contains local zones of biotite enrichment and depletion. Mild to moderate pervasive SAUS, CHL. Rare garnet.
-965.0 to -976.5: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), contact with above marked by quartz vein.
-976.5 to -999.0: BIOTITE MONZOGRANITE: medium to coarse grained, slightly megacrystic (<5%), rare garnet with noticable enrichment at 994'. Contact with granodiorite below marked by 5cm chill margin (porphyry-textured) at 40°/CA.
-999.0 to -1013.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%).



-999.0 to -1013.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%).

-1007.0 to -1010.0: BIOTITE MONZOGRANITE: medium grained, moderately equigranular, sharp contacts with granodiorite.

-1013.0 to -1014.0: BIOTITE MONZOGRANITE: porphyritic.

-1014.0 to -1018.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), contacts with biotite-monzogranite at 40°/CA.

-1018.0 to -1031.5: BIOTITE MONZOGRANITE: medium to coarse grained, megacrystic. Rare garnet. Contact with below marked by 20cm wide porphyry-textured zone.

-1031.5 to -1050.5: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), common small xenoliths.

-1050.5 to -1059.0: LEUCOMONZOGRANITE: medium grained, moderately equigranular, mild to moderate pervasive CHL; small (<3mm) garnets common.
1058': 15cm aplite/pegmatite dyke containing abundant very small (<2mm) garnets with concentration at contact with above

-1059.0 to -1080.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), ; contact with below marked by biotite-rich band

-1080.0 to -1101.0: LEUCOMONZOGRANITE: medium to coarse grained, moderately equigranular, rare garnet crystals.

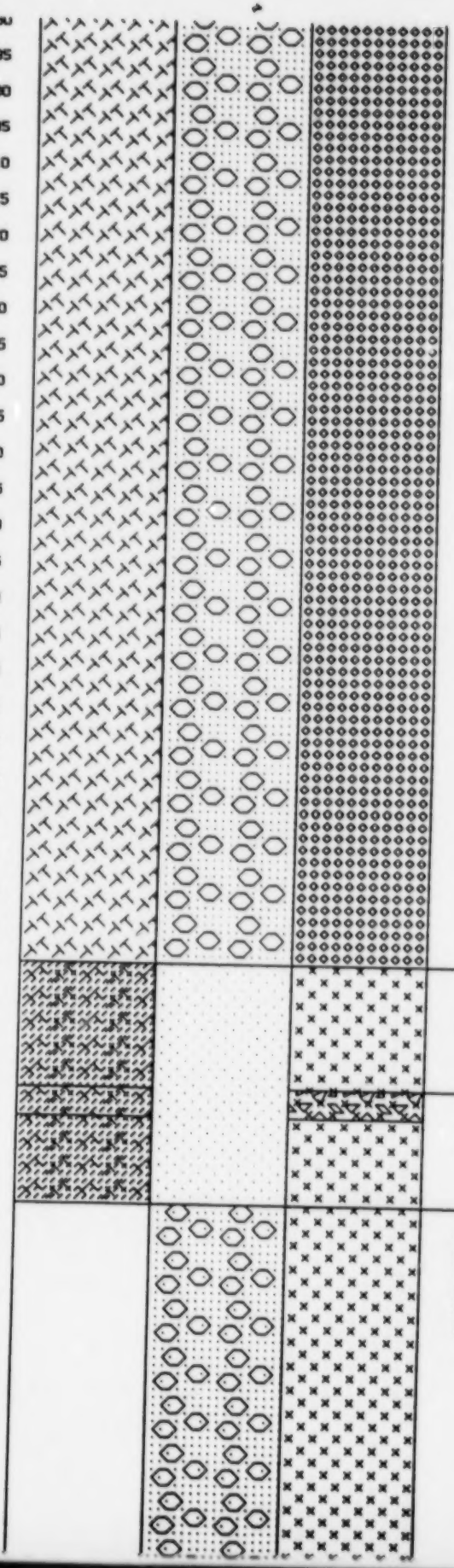
-1101.0 to -1106.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%); in sharp contact with above

-1106.0 to -1124.0: LEUCOMONZOGRANITE: medium to coarse grained, slightly megacrystic (<5%), section contains several granodiorite xenoliths; 10cm wide zone of garnet enrichment at 1122'

-1124.0 to -1140.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%).

-1140.0 to -1151.0: BIOTITE MONZOGRANITE: medium to coarse grained, moderately equigranular.

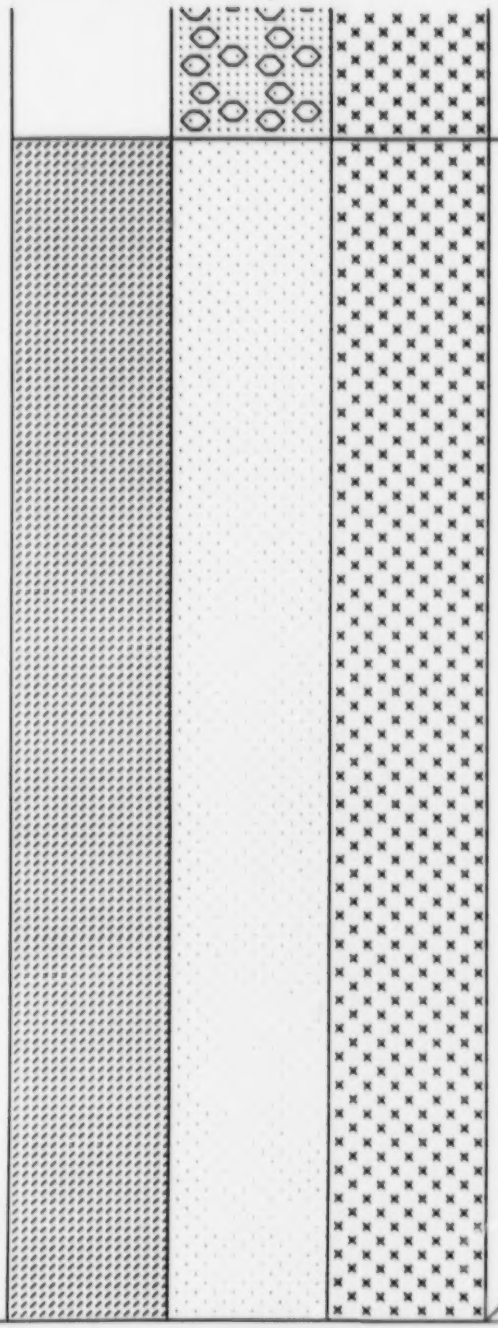
-1151.0 to -1320.0: GRANODIORITE: medium to coarse grained, slightly megacrystic (<5%), ; section contains 2 large (10cm) mafic porphyry xenoliths ; also several narrow shear bands at 30°/CA associated with calcite veins and intense fracture-controlled KFELD and CHL.



-1320.0 to -1353.0: LEUCOMONZOGRANITE: medium to coarse grained, moderately equigranular; minor garnet; moderate to intense pervasive SAUS, CHL; moderate fracture-controlled KFELD.

-1337.0 to -1341.0: BRECCIA: abundant calcite veins, with minor pyrite disseminations, intense pervasive KFELD.

-1353.0 to -1405.5: LEUCOMONZOGRANITE: fine to medium grained, moderately equigranular, locally medium to coarse grained, slightly aegacrystic (<5%), minor garnet crystals, moderate to intense KFELD; numerous bleached fractures at 30°/CA ; microgranite dykes (<15cm) containing minor garnet at 1375° and 1392°.



-1405.5 to -1544.0: LEUCOMONZOGRANITE: medium to coarse grained, moderately equigranular, mild to locally intense SAUS, CHL; moderate to intense pervasive KFELD. Section contains several narrow garnet-bearing micrograniite dykes and pegmatite/aplite segregations occur. Intense fracturing from 1427-1431'. Intercalated biotite-rich and garnet-rich bands over 3' from 1525'.

-1544.0: E N D O F H O L E

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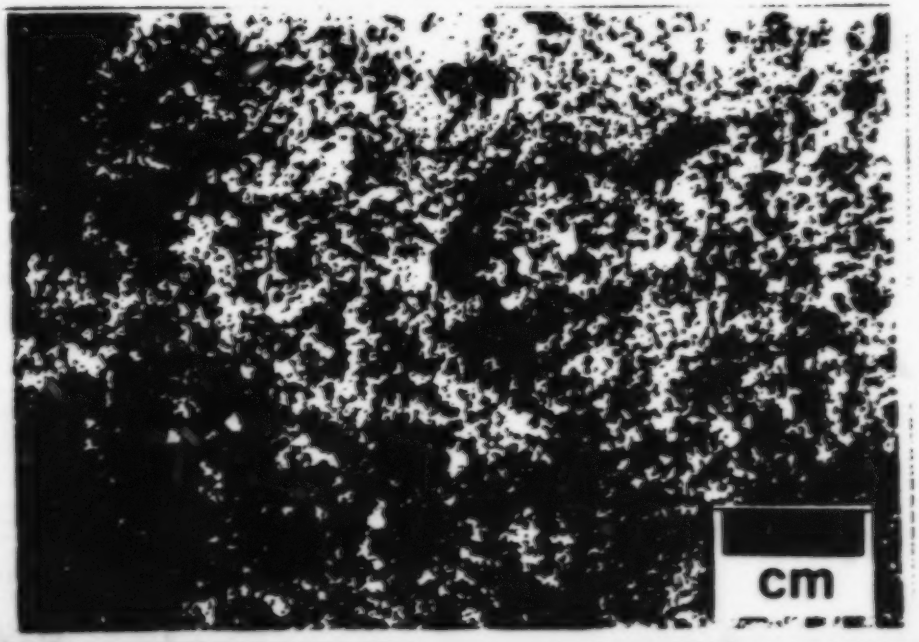
cm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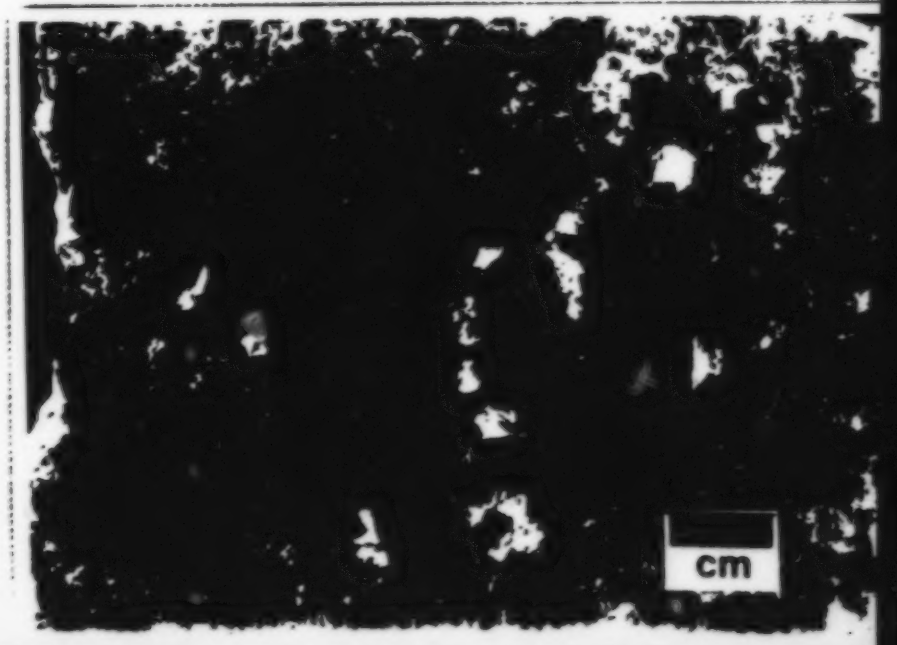
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